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To:	Joseph P. Hirl	**From:**	Tom Champagne
Fax:	571.273.3685	**Pages:**	6, including cover
Voice:	571.272.3685	**Date:**	5/16/2005
Re:	10/049,650 Draft Claim Set	**CC:**	

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Dear Mr. Hirl,

Thank you for getting back to me so quickly. As you requested, I'm transmitting a claim set to go with the new proposed claim that I sent to you earlier.

I assume that you will be canceling the current claims and submitting this set as new claims, so I renumbered my proposed claim 1 as claim 12. Claims 13-15 and 18-23 correspond to claims 2-4 and 6-11, respectively.

Claim 16 corresponds to claim 5, and has been reworded in consideration of your concern regarding multiple dependency, such that it only depends from claim 15 (4). Claim 17 is the same as claim 16, but depends from claim 12 (1) rather than from claim 15 (4). To include all the combinations of claim 5, I also included an independent claim 24, which substitutes the identifying and eliminating actions of claim 12 (1) with those of claim 15 (4). Claim 25 is the same as claim 16 (5), but depends from claim 24 rather than from claim 15 (4).

I hope that I have explained the claim organization clearly; if you have any questions, please call me. Also, if it would be convenient for you to have an electronic version of this claim set, please let me know and I will e-mail it to you.

Thank you,

Tom Champagne

12. A method for training a neural network in order to identify a patient risk function such that the structure of the neural network is simplified, wherein the neural network includes

- an input layer having a plurality of input neurons that receive input data,
- at least one intermediate layer having a plurality of intermediate neurons,
- an output layer having a plurality of output neurons that provide output signals, wherein the output signals define the patient risk function following a first occurrence of a disease on the basis of given training data records including objectifiable and metrologically captured data relating to the medical condition of a patient, and
- a multiplicity of synapses, wherein each said synapse interconnects a first neuron of a first layer with a second neuron of a second layer, defining a data sending and processing direction from the input layer toward the output layer,

wherein the method comprises:

identifying and eliminating synapses of the multiplicity of synapses that have an influence on the curve of the risk function that is less than a predetermined significance, including

determining pre-change output signals of the neural network,

selecting first and second sending neurons that are connected to the same receiving neuron by respective first and second synapses,

assuming a correlation of response signals from said first and second sending neurons to the same receiving neuron,

interrupting the first synapse and adapting in its place the weight of the second synapse,

determining post-change output signals of the neural network,

comparing the post-change output signals with the pre-change output signals, and

eliminating the first synapse if the comparison result does not exceed a predetermined level.

13. The method of claim 12, wherein the first and second selected sending neurons are located on the same layer.

14. The method of claim 12, wherein interrupting the first synapse and adapting in its place the weight of the second synapse further includes adapting a value of a bias of the receiving neuron.

15. The method of claim 12, wherein identifying and eliminating synapses of the multiplicity of synapses that have an influence on the curve of the risk function that is less than a predetermined significance further includes

selecting a synapse, after determining the pre-change output signals of the neural network,

assuming that the selected synapse does not have a significant influence on the curve of the risk function,

interrupting the selected synapse, before determining the post-change output signals of the neural network and comparing the post-change output signals with the pre-change output signals, and

eliminating the selected synapse if the comparison result does not exceed the predetermined level.

16. The method of claim 15, further comprising

repeating the identifying and eliminating actions *n* times;

wherein comparing the post-change output signals with the pre-change output signals includes

comparing the post-change output signals with the pre-change output signals prior to performing the first identifying and eliminating actions, to provide a first comparison result; and

comparing the post-change output signals with the pre-change output signals after performing the *n*-1st identifying and eliminating actions, to provide a second comparison result;

wherein the comparison result is a cumulative comparison result including the first comparison result and the second comparison result.

17. The method of claim 12, further comprising

repeating the identifying and eliminating actions *n* times;

wherein comparing the post-change output signals with the pre-change output signals includes

comparing the post-change output signals with the pre-change output signals prior to performing the first identifying and eliminating actions, to provide a first comparison result; and

comparing the post-change output signals with the pre-change output signals after performing the *n*-1st identifying and eliminating actions, to provide a second comparison result;

wherein the comparison result is a cumulative comparison result including the first comparison result and the second comparison result.

18. The method of claim 12, further comprising calculating a value of a likelihood function for the neural network to represent an expected output of the neural network.

19. The method of claim 12, further comprising comparing structure variants of the neural network using a significance test.

20. The method of claim 19, wherein the structure variants of the neural network are compared using a CHI-SQUARED test.

21. The method of claim 19, wherein the structure variants of the neural network are compared using a BOOT-STRAPPING method.

22. The method of claim 19, further comprising:

calculating a value of a likelihood function for the neural network;

wherein comparing structure variants of the neural network includes calculating a ratio of values of the likelihood functions for the structure variants.

23. The method of claim 12, further comprising optimizing strengths of connections between connected pairs of the neurons according to a simplex method.

24. A method for training a neural network in order to identify a patient risk function such that the structure of the neural network is simplified, wherein the neural network includes

- an input layer having a plurality of input neurons that receive input data,
- at least one intermediate layer having a plurality of intermediate neurons,
- an output layer having a plurality of output neurons that provide output signals, wherein the output signals define the patient risk function following a first occurrence of a disease on the basis of given training data records including objectifiable and metrologically captured data relating to the medical condition of a patient, and
- a multiplicity of synapses, wherein each said synapse interconnects a first neuron of a first layer with a second neuron of a second layer, defining a data sending and processing direction from the input layer toward the output layer,

wherein the method comprises:

identifying and eliminating synapses of the multiplicity of synapses that have an influence on the curve of the risk function that is less than a predetermined significance, including

determining pre-change output signals of the neural network,

selecting a synapse,

assuming that the selected synapse does not have a significant influence on the curve of the risk function,

interrupting the selected synapse,

determining post-change output signals of the neural network,

comparing the post-change output signals with the pre-change output signals, and

eliminating the selected synapse if the comparison result does not exceed a predetermined level.

25. The method of claim 24, further comprising

repeating the identifying and eliminating actions *n* times;

wherein comparing the post-change output signals with the pre-change output signals includes

comparing the post-change output signals with the pre-change output signals prior to performing the first identifying and eliminating actions, to provide a first comparison result; and

comparing the post-change output signals with the pre-change output signals after performing the *n*-1st identifying and eliminating actions, to provide a second comparison result;

wherein the comparison result is a cumulative comparison result including the first comparison result and the second comparison result.